

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Currently Amended) A laser-clad processing apparatus for ~~carrying out laser-clad processing onto a valve-seat portion of a cylinder head, the laser-clad processing apparatus being characterized in that it comprises~~ comprising:

a cylinder-head holding means for device holding the cylinder head in an ~~inclining manner~~ inclined orientation so that ~~the~~ a central axial line of said valve seat portion ~~becomes the~~ defines a generally vertical direction line;

a laser-processing head for irradiating a laser beam onto a process part of said valve seat portion, ~~and at the same time~~ while discharging a powdery material to the process part; and

~~rotary means which rotates~~ a rotator rotating around the central axial line of said valve seat portion in such ~~a state~~ that said laser-processing head is inclined with respect to said the vertical line direction; ~~and powdery material supply means for supplying the powdery material to said laser processing head, wherein said laser processing head includes a coaxial nozzle comprising a powdery material supply, a swirling chamber, and a rectifier, configured to provide the powdery material in a direction substantially parallel to the central axial line in an equal amount across the process part of the valve seat portion.~~

2. (Currently Amended) The laser-clad processing apparatus set forth in claim 1, wherein said cylinder-head holding ~~means is equipped with~~ device comprises:

~~an inclination means for~~ device inclining the cylinder head between two positions, a first position ~~at which the~~ wherein a central axial line of an inlet valve seat ~~becomes~~ is substantially parallel to the ~~a~~ vertical line and a second position ~~at which the~~ wherein a central axial line of an outlet valve seat ~~becomes~~ is substantially parallel to the vertical line; and

~~a horizontal-movement means for~~ device moving the cylinder head in the X-axis direction and in the Y-axis direction, which crosses with the X-axis direction perpendicularly, on a horizontal plane.

3. (Currently Amended) The laser-clad processing apparatus set forth in claim 1, wherein the laser-processing head comprises:

~~a laser-beam generation means for~~ generator generating said ~~a~~ laser beam; and

~~a coaxial nozzle through which the laser beam passes and at the same time which discharges said powdery material~~

wherein the laser beam passes through the coaxial nozzle.

4. (Currently Amended) The laser-clad processing apparatus set forth in claim 3, wherein said laser-beam ~~generation means is such that~~ generator comprises

a plurality of laser diode arrays ~~are disposed~~, and shapes said laser beam by controlling the laser diode arrays depending on ~~the~~ a width direction of said valve-seat portion.

5. (Currently Amended) The laser-clad processing apparatus set forth in claim 1, wherein said powdery-material supply means, ~~while letting said powdery-material flow to a predetermined flow-out opening, lets flow it out through the flow-out opening by means of~~ includes pressurized carrier-gas pressure, thereby to compressively ~~supplying it~~ supply the powdery material to said laser-processing head.

6. (Currently Amended) A laser-clad processing method for ~~carrying-out laser-clad processing onto a valve-seat portion of a cylinder head, the laser-clad processing method being characterized in that it comprises~~ comprising:

holding the cylinder head in an ~~inclining manner~~ inclined orientation so that ~~the~~ a central axial line of said ~~the~~ valve seat portion ~~becomes the~~ defines a generally vertical direction line;

supplying a powdery material ~~along said~~ into a swirling chamber, and rectifying a swirling flow of the powdery material to flow in a direction substantially parallel to the central axial line to be provided in an equal amount across the valve-seat portion while holding a laser-processing head in an inclined ~~manner~~ orientation with respect to the vertical direction and rotating ~~it~~ the laser-processing head around the central axial line of said ~~the~~ valve seat portion; and ~~at the same time~~ irradiating a laser beam to carry out the laser-clad processing.

7. (Currently Amended) The laser-clad processing method set forth in claim 6, wherein

~~the shape of said laser beam is~~ has a rectangular shape.

8. (Currently Amended) The laser-clad processing method set forth in claim 6, wherein said laser-processing head ~~is rotated normally and is rotated reversely~~ rotates in a first direction, and rotates in a reverse second direction along said ~~the~~ valve-seat portion.

9. (Currently Amended) The laser-clad processing method set forth in claim 6, wherein said ~~the rectified flow of the~~ powdery material ~~is discharged so as to deposit concentratedly~~ results in a concentrated deposit on the valve seat portion within a circle whose diameter is adapted to a side of said ~~rectangular-shaped~~ the laser beam, ~~the~~ a side crossing with perpendicular to the processing development direction ~~perpendicularly~~.

10. (Currently Amended) The laser-clad processing method set forth in claim 6, wherein the ~~powder~~ powdery material is melted by irradiating said ~~the~~ laser beam behind ~~the~~ a deposition center of said ~~the~~ powdery material by a predetermined distance with respect to the development direction of laser processing.

11. (Currently Amended) The laser-clad processing method set forth in claim 6, wherein, when stopping the ~~compressive~~ supply of said ~~the~~ powdery material,

the flow of said powder material is stopped, and said a carrier gas pressure by means of ~~carrier gas~~ is lowered toward a predetermined value while taking a predetermined time since the time at the flow stoppage or immediately before the flow stoppage.

12. (Currently Amended) The laser-clad processing method set forth in claim 6, wherein: before ~~compressively~~ supplying said the powdery material, ~~the~~ a carrier gas flow volume of ~~said carrier gas~~ is increased; immediately before starting the flow of said the powdery material, ~~it~~ the flow volume is decreased to a steady flow volume; and immediately before ~~the~~ a flow stoppage, the carrier gas is opened to air.